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Rail Road News.

Pittsburgh and Connellsville Railroad.

A public meeting was held at Somerset, Pa., in favor of this road, at which it was resolved that, as steamboat navigation will soon be completed from Pittsburgh to Connellsville, leaving 79 miles of railroad to connect the steamboats of the Ohio and Mississippi with the Chesapeake and Ohio Canal, and the Baltimore and Ohio Railroad at Cumberlend, application be made to the Legislature of Maryland, at their next session, to incorporate a company to meet the Pittsburgh and Connellsville Railroad Company at the State line. A committee of twenty-five, to prepare a petition was appointed. The resolutions expressed the opinion that Somerset county would subscribe half a million to the road.

Auburn and Ithaca Railroad.

Another meeting is to be held at Auburn to take measures for building a Railroad from Auburn to Ithaca, N. Y. This road in connection with the Ithaca and Owego road, will form a direct Railroad communication between the Central line of roads at Hudson and the Erie Railroad at Owego, and a short and complete route to New York, The directors of the Cayuga and Susquehanna Road, it is stated, will furnish the iron for the new road and take stock in payment.

Rutland Railroad.

The Rutland Railroad from Burlington, Vt., was opened to Mount Holly; Mass., last week.

The Vermont Central Railroad is now open also to Bosten.

The Worcester (Mass.) Railroad Company, are building a fence seven feet high around the inner part of the Passenger depot in Boston, from which the outward trains start, in order to make every passenger, season as well as transient, show his ticket to men stationed at the gates, before entering the cars.

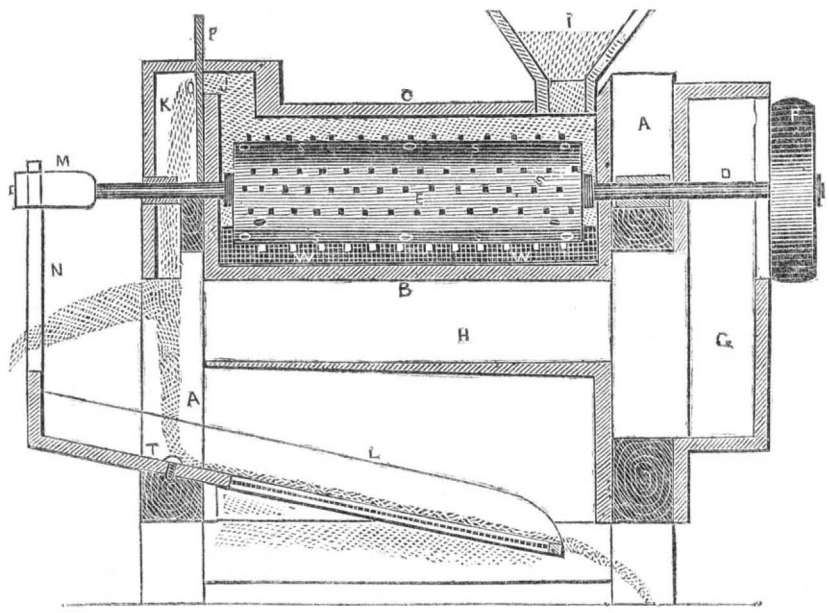
The Papel Triumvirate have decided that the railway to Naples is a useless scheme, "tending to inundate Rome with worthless foreigners;" they have, therefore, definitely suspended the works, and thereby thrown thousands out of employment.

A project is now before our City Farthers to run a railroad down the Sixth Avenue to Carmine st., and along Varick to Canal then up West Broadway.

Receipts at the Fair of the American Institute.

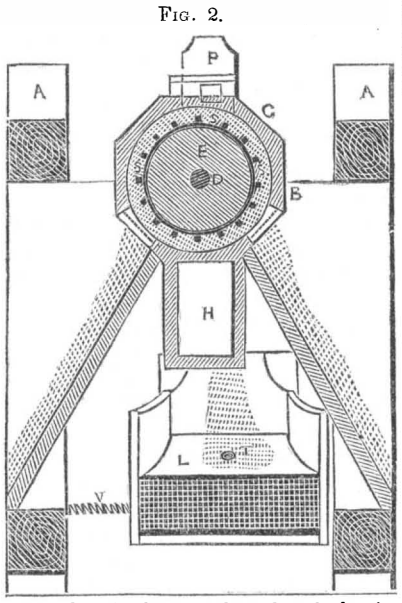
The Managers of the American Institute report the entire receipts at Castle Garden, in October, at $18,670. Including exhibitors, and other free admissions, we presume a quarter of a million of persons visited the exhibition.—The expenses were about $12.000, leaving $6,-700 for profit, of which $5,000 has already been applied to the purchase of the building now occupied by the Institute in Broadway.—One manufacturer who exhibited his wares at the late Fair states that orders to the amount of $30,000 followed such publicity. Another instance of the advantage of letting the public know what you have to sell.

BUCKWHEAT SEPARATOR.---Fig. 1.



This machine is the invention of Messrs. Calvin D. Vose and Thomas L. Vose, of Mehoopany, in Wyoming County, Pennsylvania, and for which he has taken measures to secure by patent. Fig. 1 is a longitudinal vertical section, showing the interior, and fig. 2 is a transverse vertical section. The same letters refer to like parts, on both the figures. A A is the frame, consisting of posts and transverse timbers. B is a hollow stationary cylinder, formed of two parts, the upper, C, can be removed at pleasure; D is the driving shaft working in suitable bearings and carrying a revolving cylinder, E. This cylinder is made of wood but is covered with iron plates screwed on to it, and which are covered with studs, S S. F is the driving pulley; it is cased over, and has fan blasts blades inside, and answers both for pulley and blower. It communicates

FIG. 2.



at the end with the outside and with the inside, driving the blast through the pipe, H, to cleanse the grain; I is the hopper, to receive the uncleaned wheat, and J is a recess at the opposite end of the chamber of the hollow cylinder, through which the wheat and lightmatter is forced at the opening, O, down into the passage, K, to receive the action of the blast, as represented. P is a slide to graduate the size of the opening, O. When the cylinder, E, is revolved, it stirs the buckwheat and hulls it, when the smaller and heavy extraneous particles are driven through the fine screens, W W, (best seen in fig. 2.) and fall down, while the buckwheat and light matter is forced up and into the passage, K, to be acted upon by the blast, as represented, and the lighter particles separated from the good grain, which falls upon the inclined screen, L, which is very fine, and receives a vibratory motion—shaking down the last of the heavy extraneous impurities, allowing only the good clean buckwheat to escape at its mouth into a proper receiver. The lower screen, L, is fixed on a pin, T, and N is a bar attached to the end of it (the screen); V is a helical spring, also attached to the screen, and to the frame. M is a cam on the end of the shaft, D, and as it revolves it comes in contact with the bar, N, striking it, and thus shaking the inclined screen, L, below. From the two cuts a good idea of the nature, construction and use of this machine will be obtained. The buckwheat, by being beaten in the hollow chamber, B C, by the toothed revolving cylinder or roller, E, will be very effectually hulled, more especially as the orifice, O, (best seen at the end, fig. 2) can be graduated to any size, so that a great pressure may be employed, if required, to force the grain into the passage, K; and thus the particles of the grain are rubbed upon one another, and act upon themselves to clean the grain in the same way as if the berries were rubbed with sand paper. The good arrangement and the principle of action combined, in this machine, cannot be mistaken. More information, (*p.p.*) may be obtained of the inventors.

Density and Elasticity of Air.

The elastic force of air varies in exactly the same proportion of its density; and this simple and important law, which is called, after its discoverer, the law of Mariotte, applies not only to air, but to all gaseous bodies when subject to such variations of pressure as can be readily commended. Air has been allowed to expand into more than 2000 times its usual bulk, and it would have expanded still more if a greeter space had been allowed. Air has also been compressed into less than a thousandth of its usual bulk, so as to become denser than water; but its elasticity has not been exactly determined at these extreme degrees, either of condensation of rarefaction. so that we have no proof that the law of Mariotte applies so extensively. On the contrary, recent experiments on the compression of gases render it nearly certain that they all vary from this law when subject to very great pressure their density being increased in a greater ratio than their elasticity; this variation, however, is less in air than in most other gaseous bodies and the simple law is found to appply to it very accurately when condensed as much as 50 times, and also when allowed to expand to several times its usual bulk.

Useful Receipts.

Clarification by Eggs, or Gelatinous Substances.

The effect of the albuminous and gelatinous matter is principally remarkable in the vinous liquids. It is on this account that they are employed when it is required to fine wines and other fermented liquors; that is to say, when we wish to give them that high degree of limpidity which they can rarely acquire and preserve by mere repose. In this case, nothing more is required than to dissolve eggs, isinglass, hartshorn shavings, or any similar substance, in a small quantity of the liquid, and to mix this solution, cold, with the remainder. A short time after a kind of net-work is observed throughout the whole mixture, which, soon contracting together, collects all the foreign substances from the fermented liquor, and carries them with it to the bottom of the vat.

In other instances, it is necessary to heat the liquids with which the eggs are mixed, and it is only at the moment of ebullition that the clarification takes place; most of the foreign made syrups are clarified by this process, and no others has yet been discovered that produces a better effect.

It is also observed, that egg alone is not always sufficient to clarify liquids, even if they are raised to a degree of temperature sufficient to make them boil, but that it is necessary to assist its operation by means of an acid, or a salt with a redundance of acid. In proof of this, may be adduced what takes place in the clarification of whey; for it is only when there is added to this fluid at the moment when it begins to boil, some cream of tartar or vinegar that the egg with which it had previously been mixed, coagulates, and carries with it the cheesy matter, which impared the transparency of the whey.

It is absolutely necessary to separate the magma which forms in liquors that are clarified with egg, especially when in order to concentrate those liquids, it is necessary to evaporate them by the aids of ebullition. Without this precaution this magma would dissolve, and these liquors would become more turbid than they were previous to the clarification- It proceeds from a similiar cause that broth, from which the scum has not been taken off, always retains a disagreeable appearance and will not keep.

Though the employment of albuminous matter for clarifying the juices of certain vagetables be of utility, it is however not without its inconveniences. Amongst others, one that has been remarked is, that it changes the nature of these fluids in such a manner as partly to destroy the medicinal properties. It often happens to certain pharmaceutical preparations, such as decoctions of medicines, that when in order to clarify them, recourse has been had to white of egg and heat, they are almost without effect, unless we take care to double the proportions of the ingredients that ought to enter into their composition. Dr. Lewis has even remarked, that this operation deprived the syrup of white poppies of all its powers.

Pumpkin Soup.

Into two quarts of cold water put three pounds of pumpkin, cut into thin slices, peeled and with all the seeds removed; two large onions, and sliced, with a small stick of celery cut into very small pieces. Boil these together slowly for two hours and a half, and then, after adding an ounce of dripping, two large tablespoonsful of flour, and of pepper and salt as much as pleases the taste, boil for half an hour longer, stir frequently during the whole of the boiling.

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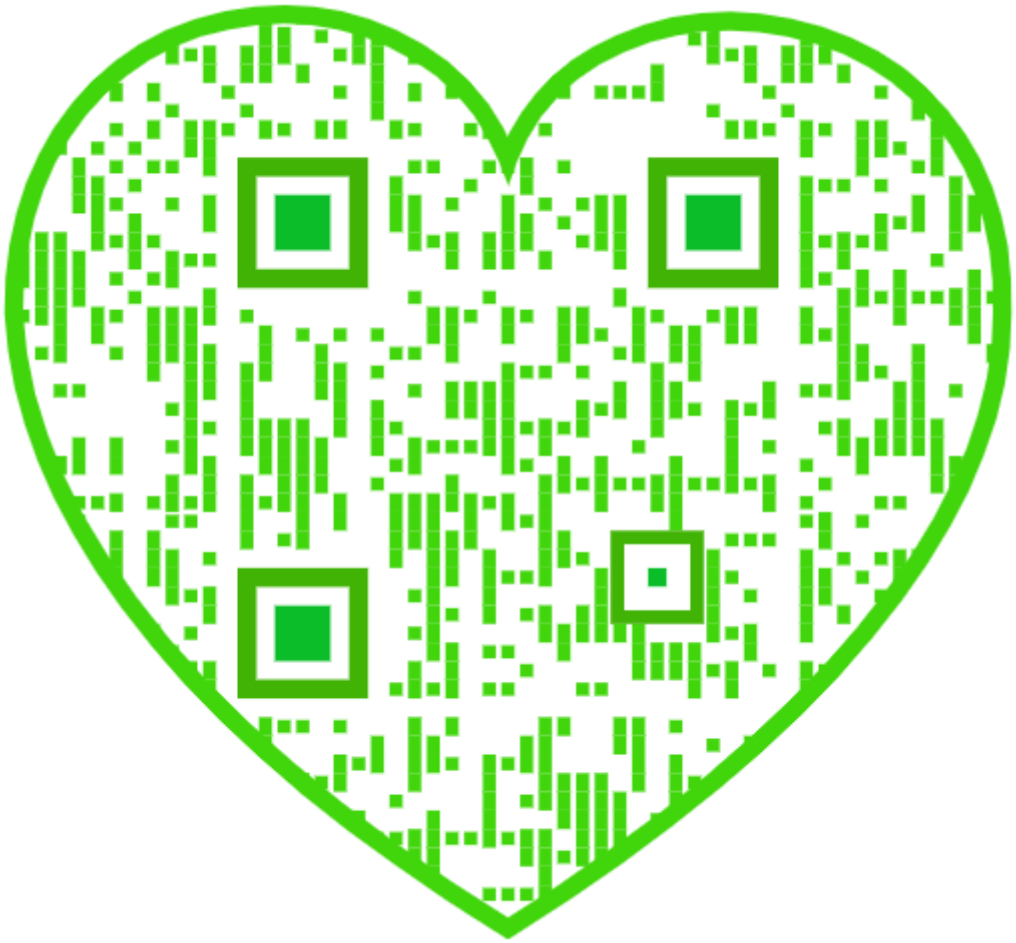

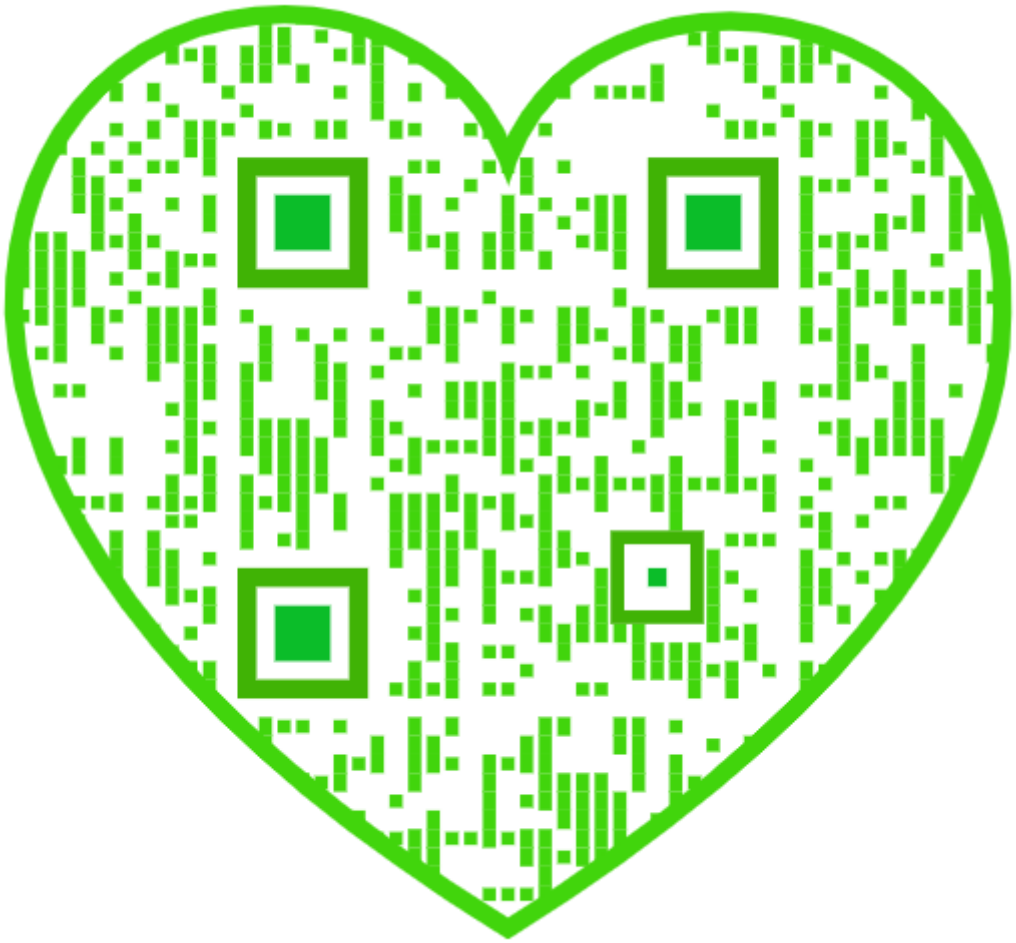

Miscellaneous.

Correspondence of the Scientific American.

WASHINGTON CITY, Dec. 1st, 1849.

Within the past few days this city has been transformed, as it were by magic, from comparative quiet to a state of the most intense exciement. Politicians of every grade and description are rapidly congregating at the great political arena, all wanting something, which they are determined to obtain if perseverance and importunity upon the high pressure system can avail. From the present time to the close of the Session, stagnation will be unknown. But in this age of steam and electricity it will not do to stand still. Motion, action, progress—are the words which now fill the whole world with their stirring demands, making humanity's heart pulsate with a stronger bound. There is now something for all to do. The world is becoming wider in magnitude, closer in interest, and more eventful than of old: not in deeds of barbarism, but in the leaping, vivifying impulses of a better birth of the soul.

The official communication of Lieut. Maure, in favor of a railroad from the Mississippi to the Pacific, is a very interesting paper, and it is thought he satisfactorily demonstrates that such a road will be the best and the most efficient fortification that can be devised for the protection of those distant shores. In support of his assertion he alludes to the following fact, which belongs to the history of the times:—"In the difficulties with Great Britain, pending the North Eastern Boundary Question, that power, before she sent her Minister Plenipotentiary to Washington with her ultimatum, proceeded to assemble on our coasts and around us, a fleet greater than the whole American navy; and notwithstanding she was engaged in two distant and expensive wars, one third of the whole standing army of Great Britain was sent to North America. Her sea captains had instructions in case a certain contingency should arise, to proceed, and without further orders to commence hostilities by an attack upon our frontier seaport towns; war was to be declared at the cannon's mouth.—Suppose the attack had been made upon New York, and that the systems of railroads and magnetic telegraphs in the old States had been then as complete as they are now—before the echo of the first broadside of her "wooden walls" had died away in the highlands of Neversink, the magnetic telegraph would have announced the fact of war, bloody war, in all parts of the country, and the next hour would have found the trains of a thousand engines, filled with soldiers from the North, the South, and the West, all speeding with terrible rapidity to the scene of action."

This is a striking illustration of the advantage of rail roads, and if the alternative could be submitted to our military men, as to whether, in defending the country, they would rather have the present fortifications without the railroads, or the railroads without the fortifications, there would be but little doubt as to their choice.

As usual, there are some scores of inventive philosophers on here for the purpose of asking aid from Congress in building their models. There are three men with the balloon mania, one of whom pledges his sacred honor that if the Committee of Ways and Means will recommend an appropriation of $10,000, he will convey the three hundred members through the air, in spite of the wind, to Baltimore and back again in less than two hours. He also proposes to carry the U. S. Mails for one-eighth the present rates, dropping them at the several stations with the least possible delay. The advocates of the cheap postage system had better see to it.

Another genius is prepared to communicate a secret to Congress, by which "grubs and worms, which infest fruit trees, can be effectually destroyed." He values the secret at the small sum of $100,000.

There are at the capital several models of rotary pumps, one of which, it is said, is capable of throwing up nearly 1000 gallons per minute. I presume it is the same as that ordered by Capt. Stockton for his gold mine in Virginia.

I conversed with a gentleman from your city this morning, who feels confident that he has at last hit upon a plan for establishing a telegraphic communication with Europe. Should this ever be accomplished, what a proud day will it be for science! The blue waves of the Atlantic once conquered, we could then communicate with the whole world, and the inhabitants thereof would soon necessarily become "one language and one speech."

Mr. Leavens, of Springfield, Mass., is here putting up his patent "sash and blind machines;" they work admirably, so much so, that there was a keen competition for the purchase of the right for this district. It is to be regretted, however, that there are no competent mechanics here, for when a fine model is wanted, the order is almost invariably sent North. The fact is there is so much false pride here that a mechanic is looked upon as an inferior being, and the expression "he is only a mechanic" is quite common. In such a state of society, it cannot be expected that the skillful artisan will take up his abode where he and his family are treated with contempt. If the hundreds of clerks who are daily trembling lest they shall be turned out of office, were good mechanics, it would save them a world of trouble. *

The Spirit World.

There has been quite an excitement in Rochester, N. Y., about mysterious sounds heard by visitors in the presence of three bespirited young ladies. Committees of ladies and gentlemen have been appointed to try and find out the cause, but all in vain. The ladies' committee divested the be-spirited damsels of their clothing to find out whether that something or other, we suppose, was not concealed underneath, but the sounds were heard just as well. They were placed on feather beds and all sorts of non-electric conductors, but the sounds were heard just the same—thus proving, no doubt, that there is no relationship between spirits and magnetic currents. The sounds reported to be heard, are certain raps on the floor or wall, and these raps have been formed into a kind of alphabet, to repeat certain names, &c. (queer, this, very.) We perceive by the names of some of the gentlemen on the committees, that they are men of high standing in Rochester, and some we know personally. It will all turn out to be a piece of nonsense, because the raps and all that has been done, is stuff—nothing sensible or of utility. All ghost stories are made up of just such miserable fiddle-faddle—and we all know that the swallowing of pins, mounting the air on broomsticks, &c., constitute the amount of witch learning.

The late Steamboat Explosion at New Orleans.

From testimony which has been adduced since this most terrible accident took place, it is very evident that the cause of the explosion was a want of water in the boilers. Parts of the boilers that have been found exhibit the action of fire, which should have been sound, if covered with water. The boat was resting on mud, and the pumps are supposed to have been choked, or did not draw any water. In such a case as this, we see what recklessness and want of care does. The ultimate cause of such an explosion, must be a commingling of the liberated gasses of the water and some other gas, forming an explosive gas like carburetted hydrogen when mixed with a certain amount of the atmosphere. Its expansive powers must be very extraordinary, for one piece of the boiler went through two cotton bales and cut down two iron posts. No cannon ball could have done the like of this. We therefore believe that some other gas must mix with the elementary gases of the water, to produce such terrific effects as those which result from steam-boiler explosions. Of one thing we have no doubt—that is, our engineers on the western waters use steam of too high pressure, and the boilers of many of the steamboats are made of very inferior iron.

A cotton factory is about to be established at Wilmington, N. C., by an English manufacturer.

Alleged Burying Alive.

In the midst of exaggeration and invention, there is one undoubted circumstance, says the Quartely Review, which formerly excited the worst fears: the fact that bodies were often found turned in their coffins and the grave-clothes disarranged. But what was ascribed, with seeming reason, to the throes of vitality, is now known to be due to the agency of corruption. A gas is developed in the decayed body which mimics by its mechanical force many of the movements of life. So powerful is this gas in corpses that have lain long in the water, that M. Devergie, the physician to the Morgue at Paris, the author of a text-book on legal medicine, says that unless secured to the table, they are often heaved up and thrown to the ground. Frequently, strangers seeing the motion of the limbs, run to the keeper of the Morgue, and announce with horror that a person is alive. All bodies, sooner or later, generate gas in the grave; and it constantly twists about the corpse, blows out the skin till it rends with distention, and sometimes bursts the coffin itself. When the gas explodes with a noise imagination has converted it into an outcry or groan; the grave has been reopened; the position of the body confirmed the suspicion, and the laceration been taken for evidence that the wretch had gnawed his flesh in the frenzy of despair. So many are the circumstances which will constantly occur to support a conclusion that is more unsubstantial than the fabric of a dream.

Something for Astronomers to get up a Discussion About.

Prof. Matteson, who is lecturing on Astronomy in Newark, quite startled his audience, says the Newark Daily Advertiser, by indulging in several curious speculations in regard to the curse resting upon our globe as the results of the first transgressions, and upon the question of its having extended to the moon. The question of the moon's participation in the final conflagration of our globe, and of her continued attendance upon the "New Earth," after the Day of Judgement, as she did upon our new made world before the fall of Adam, were also considered."

[There is one question which should be settled by believers in the Bible before they begin to speculate upon the manner of the moon's destruction, and that is, the preparation of man for the world's destruction.

Copper at Pittsburg.

The works erected at Pittsburg for the smelting of Lake Superior Copper, now smelt from six to eight tons per day. The Detroit Free Press, remarking upon this, says the amount of minerals melted this year is 900,000 pounds—the product of which is 540,000 or 60 per cent. But as copper is largely mixed with the slug to be melted over, the average yield is estimated at 65 per cent. From the amount of metal received and that to receive, about 600 tons of copper will be made this year at the Pittsburgh furnace.

The capitalists of Pittsburg seem determined to make something out of our mineral resources. It would seem, that if copper can be transported to Pittsburgh and there smelted at a large profit, that capitalists might reap large profits from smelting works here. Having a direct water communication by steam vessels with the mining regions, and having every facility that could be offered anywhere for the erection of smelting works, manufacture and stripping of the smelted copper, it seems strange that our own capitalists take so little interest in the matter.

The Free School law submitted to the people of the State of New York at the recent election, has been adopted by the following vote: For Free Schools, 249,972; against Free Schools, 91,951. Majority, 157,521.—This is a glorious majority against the advocates of ignorance and darkmindedness.

Professor Kollenati, of Berlin, has propounded a theory that men shed their skins as animals do their coats, and that like them they assume a thicker or a thinner covering, according to the climate in which they reside. The professor is correct, but rather late in his declarations, to be considered a new discoverer.

Gliddon's Panorama of the Nile.

This Panorama was opened for a primary private exhibition, to the faculty of the New York press, and the friends of Mr. Gliddon, on Tuesday of last week. The Panorama of the Nile, as a work of art, is unequalled by any that we have ever seen. The figures of horses and camels, that compose part of the scenes, were painted by a master-hand—they are more like living figures than representations. The work is derived from the studies of Mr. Bonomi, the traveller and artist, Messrs. Henry Warren, Fahey, John Martin and Edward Corbould, of London, were the artists—a galaxy of talent which would let no poor piece of workmanship pass out of their hands. Mr. Warren is President of the Water Color Society, and is a man of fame.

We have every thing to say in favor of the panorama, but have to regret that the compliment to the gentlemen, (and ladies too) of the Press, was enough to *press* the very essence of good nature out of them. It was too crowded by far.

Hartford Arts Union.

The Association composed of mechanics, manufacturers and artisans, at Hartford, Ct., has completed its organization, and elected its officers. We have received a copy of the constitution, and see a very excellent article in the Hartford Courant, explaining its objects. We cannot but say a good word for this Institution. All the people in Hartford are acquainted with its objects by this time, and every true-hearted man must respond to their nobleness of aim. No young man in Hartford can plead any excuse for not joining it, the terms are so moderate. The names of the gentlemen who have been elected to office is a sure guaranty to us, that it will soon be an Institution of which Hartford will feel proud.

Interesting Fact in Grafting.

Du Hamel, the celebrated French pomologist and horticulturist, ingrafted a young lemon, of the size of a pea, upon the branch of an orange tree. It grew there, ripened, and had all the qualities of the lemon, without partaking of any of the properties of the orange. It is evident, in this instance, that the stalk of the lemon changed the color, taste and smell of the juices of the orange tree. And from this experiment, we have reason to conclude, that all the different figures, colors, tastes, and smells, which we find in different plants, are formed in the plants themselves.

Worcester Mechanics' Association.

We have received a copy of the Reports of the different Committees that were appointed to examine the merits of the machine, works of art, &c., which were exhibited at the late (Second Annual) Exhibition of the Worcester County Mechanics Association. We wish that we had room to copy all these reports; the language is so judicious and the ability of the various committees, for their different duties, so manifest, that we cannot but look upon itself as a valuable commentary upon many works of art.

Convention of Iron Masters.

A Convention of a number of iron masters of the United States, met at Pittsburg two weeks ago, and published a number of resolutions against an *ad valorem* duty. They want a duty of $9 put on every ton of iron, when priced at $15, and to be reduced as this price increases; and passed resolutions calling upon Congress to do something to relieve their trade.

New British Coinage.

The British Government has commenced to make a new currency or coin upon the American Decimal Sytem: cents and florins are to be used—the cent to be about one half an American cent—the florin 100 cents (50 American.) They might with more good sense have adopted the American currency in *toto*.

Pennsylvania supports a population of only 500,000 less than the whole six New England States, but the man-fame of the two are sadly disproportionate in favor of the Free School region.

The Fastest Steamboat in the World.

The steamboat Alida made a recent trip to Albany, from this city, running at the rate of 21 miles per hour.

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Practice of the British Courts in Relation to Infringement of Patents.

This article, according to the promise we made in our lasts week's number, is taken from Webster on the Law and Practice of Letters Patent:

An infringement of letters patent is prohibited by the clause contained in the letters patent, upon such pains and penalties as may be justly inflicted on offenders for contempt of the royal command. Prior to the state of monopolies all questions of this nature were tried in the star chamber, as contempts of royal authority; but by the second section of that statute, all monopolies are to be tried by the common laws of the realm.

Hence the remedies which now exist are by bill in equity, and by action at law on the statute.

A bill in equity is very frequently first resorted to by a patentee for the protection of his rights. The course is advisible where the patent is really good, since the injunction will prevent further infringement; and if the validity of the patent be questionable, the defendant being restrained until the validity is tried at law, the patentee will be in a better situation than if he had to depend on a jury for damages. Also the trial taking place under the direction of a court of equity, the plaintiff may be in a better situation as to evidence than he would otherwise be.

A court of equity protects patentees who have had enjoyment and possession under their patent, by restraining the defendant; and the principle upon which the court interferes is, that property in the patent may be inferred from the possession, and that the patentee has been fraudulently treated by the defendant.

The bill states the invention, the grant, the enrolment of the specification; the novelty and utility; and the infringement by the defendant. It prays an account of the profits, and an injunction that the defendant may be restrained in the infringement. It is also generally part of the prayer of the bill, that the right, if disputed, may be tried and determined at law under the direction of a court of equity; the final object of the bill being a perpetual injunction to restrain the infringement of the right claimed by the plaintiff. But it is not necessary that the right be established by an action at law before filing the bill, a right under the letters patent being matter of record.

The bill must state a sufficient case to justify the injunction, and the plaintiff must not depend on the admissions contained in the defendant's answer, for granting or continuing the injunction.

On filing the bill, an injunction is usually moved for and obtained until answer or further order. It is generally granted on the *ex parte* affidavits, and the defendant is commanded either to refrain in future from the alleged infringement, or to keep an account of the proceeds until it can be determined whether the patent is valid, and whether it has been infringed by the defendant. Formerly the court would not interfere, unless the party had a clear legal right, and if an injunction were moved for on filing the bill, the right must have appeared clearly by affidavit, and if moved for on answer, it must have been clearly admitted by the answer, at least not denied. But the severity of this rule is relaxed, and it is now held sufficient if the party can show possession under colour of title; and in claims of right under letters patent, the court had gone further, and granted and continued injunctions until hearing upon possession alone, although the title to the patent may be very doubtful, and a long and exclusive enjoyment will entitle a party to an injunction, until an action can be tried at law.

The affidavits, in support of the bill for an injunction, must state with particularity the alleged infringement; that the party, at the time of the application, believed himself to be the first and true inventor, for the belief of this, at the time of the application for the letters patent, will not be sufficient.

An injunction having been granted, the defendant in his answer must show, either that the letters patent are void, or that he has not infringed them. If the answer deny the novelty and utility of the invention, and state (such being the fact) that the specification is imperfectly set forth in the bill, the court will dissolve an injunction previously obtained, giving the the plaintiff liberty to bring an action, although the defendant admits by his answer that he has made machines upon the principle of the patent.

The answer being read, the injunction granted on the filing of the bill may be moved to be made perpetual or to be dissolved, or if refused when the bill was filed it may now be moved for. The court, in the exercise of its discretion, will continue or dissolve or grant the injunction, or will continue it and direct an issue at law to try the validity of the patent, or in disolving it will leave the party to bring an action at law for the infringement, directing in either of these latter cases, that an account be kept pending the litigation, or, if the affidavits are very contradictoy, dismiss the suit altogether.

The court, in directing a trial at law, will put the parties upon such conditions as the equity of the case may require. It will order admissions of particular facts and documents; also, an inspection of the defendant's premises and machinery, when the invention is practised in secret.

After verdict the court will, on motion, revive and make perpetual the injunction, unless there is reason to believe that the verdict will be disturbed, or a new trial granted.

Scientific Memoranda.

THE MAGNETIZATION OF HEAT.

Shortly after the brilliant discovery by Faraday of the rotation the plane of polarization of light produced by magnetism, M. Wartmann announced that he had tried the same experiment upon radiating heat. Many practical difficulties presented themselves. He employed the heat of a lamp, which he partially polarized by passing it through two piles of mica crossed at right angles. Between these piles were placed the electro-magnet, and a cylinder of rock-salt, and consequently very near the thermo-electric apparatus. The galvanometer, on the contrary, in order that the action of the electro-magnets might be preserved was at some distance; the consequence of which was a considerable increase of the length of the circuit, and a decrease of sensibility. In spite of these inconveniences, which he had clearly seen, but could not remove, M. Wartmann believed that he observed that the needle of the galvanometer, taking up a stable deviation under the influence of the ray not intercepted by the piles of mica, was displayed anew, and took a fixed position, different from the first, when the current was established, which seemed to prove rotation of the plane of polarization. Several persons are said to have failed in the attempt to re-produce the phenomenon, but MM. de la Prevostaye and Desains have succeeded, modifying, however, the process of M. Wartmann.—1st, they employ solar light; 2nd, they used for the polarizing apparatus two prisms of achromatized spar; and 3rd, which appeared to them indispensable, instead of placing the principal sections at 90°, they arranged them at an angle of very nearly 45°. They fully believe that their experiments establish, beyond a doubt, the rotation of the plane of polarization of heat under the influence of magnetism.

THE AURORA BOREALIS.

M. De la Rive experimentally supports the hypothesis that the luminous matter of the aurora is due to the electric fluid contained in the atmosphere at great heights, where the air is rarified. He shows that the light which results from the re-union of the two electricities in the upper part of the atmosphere of the polar regions, instead of remaining indefinitely distributed, is carried by the action of terrestrial magnetism round the magnetic pole of the globe, whence it seems to raise itself in a whirling column. This explains, he thinks, why the magnetic pole is always the apparent centre from which the light that constitutes the aurora borealis proceeds, or towards which it seems to converge.

DEPTH OF THE OCEAN.

We have received a communication from a correspondent, stating that according to calculations that have been made, water is compressed by 15 pounds pressure to the square inch, to one 22,000 less its bulk. At this rate of 330,000 pounds would compress the water to a 22,000th of its original bulk. Oersted makes out that at the depth of 6000 feet a cubic foot of water would be compressed to about 5½ cubic inches. We do not believe any such *philosophizing*—give us facts, submit water to the pressure, and then let us know the result—we have, and know. Our correspondent thinks that water at a certain depth, would become dense as lead. Water has been submitted to the pressure of 1,300,000 lbs. to the square inch, and it was perfectly fluid at that.

ANIMALCULÆ OF THE SEA.

We have received a communication from a valued correspondent, who questions the accuracy of the reasons set forth on page 74, for the animalculæ, at 2000 feet deep in the sea, not being *crushed*. The reasons adduced there, is, that "the hydrostatic pressure is equal on all sides." Our correspondent says that he "cannot see how the fluid presses equally on all sides," for "if this were true," he says, "a body possessing no more than the 100th specific gravity of water or atmosphere, would have no more a tendency to rise in it than to sink." This is just where our correspondent has mistaken the matter, for the reverse is true. If the hydrostatic pressure was not equal on all sides—the lighter body than the fluid could not rise. We walk at the bottom of an ærial ocean, if raised to the top and the pressure removed from the surface (equal on all sides) of our bodies, they would swell and burst. This occurs partially to travellers who ascend great heights, and every æronaut knows it to be true. Our correspondent must again read the concluding part of the article to which he refers,—the animalculæ do not rise to the top, any more than we can fly, but they move about as we can.

Telegraph Feats.

MESSRS. EDITORS—Will you favor a reader of your valuable paper, with the publication of the following article, by way of correcting wrong impressions imbibed by the public, from reading a paragraph, first published in the Utica Observer, and afterwards in your paper of the 26th ult. The paragraph alluded to is in reference to a so-called "wonderful telegraphic" feat, performed by a Mr. Porter, at the time of the accident which occurred to the cars, near Fonda, N. Y. That Mr. Porter did all that was said of him at the time, we will not doubt, and that the public should think "'tis strange! 'tis passing strange!" is equally to be expected; but the question is, does the fact of its seeming so very wonderful and magic-like, to those who know nothing about the theory or principles of telegraphing, or if they do, their knowledge is very limited, prove that it is really so? Or that Mr. Porter should be immortalized for doing that which has been done repeatedly, by many others, years since, while the telegraph was only in its infancy. It is not at all uncommon for those who are connected with the business, and especially operators and those who keep lines in working order, while out on the line making repairs, after a storm, or other interruption, to write back to the offices, on either side of them, telling where they are, how far they are out, the cause of the break, &c., keeping up a spirited conversation, simply by connecting and disconnecting the ends of the wires, in a manner perfectly understood by them, as did Mr. Porter. More than this. Some are expert enough to be able to read from the sensation produced by the shocks, while holding the ends of the wires in their hands, to tell what is said at the office, where the circuit is broken, their bodies being at the time a part of the circuit itself.

Now what I wish to correct, is the impression that this one thing done by Mr. Porter is so very remarkable. It is not at least to many I might name in the science and history of the Telegraph. The press and public should use judgment not to give too favorable an opinion of any new thing performed, without first inquiring if it is not already old, and to give credit to whom credit is due.

I make these statements in your paper that they may reach those who will appreciate them—believing as I do that all of the readers of the Scientific American are men of liberal views or will be, at least if they continue to peruse its valuable pages any length of time.

ADJUSTMENT.

[The paragraph to which our correspondent alludes was different in the Scientific American from what it was in the "Utica Observer." That paper merely stated the fact—we explained the manner. Having seen the paragraph so universally copied as something never done before, we are glad that our correspondent throws both old and new light on the subject.—ED.

Paddles for Canals.

MESSRS. EDITORS—*Gents.*: The reading of the remarks of "Economy," in your journal of the 24th ult., has reminded me of my promise to furnish you with a description of my steamer, which at the time of the promise was the subject of an application for letters patent, both in this country and abroad; but owing to the attempted double-dealing of capitalists with whom I was engaged, the papers were never completed,—and the invention is now public property, and boats are now running, and others building, with the main principles of the invention incorporated into their general features. Those that are running make 6 and 7 knots per hour without surge or wash, in our narrow canals, and can make 9 in such canals as the Chesapeake and Ohio, without any damage to the banks, other than would occur when horse power is used.

The mould of the vessel, according to my specification, is that of an elipsis, through the midship cross section, the longest axis being horizontal; this axis shortens as you approach the stem or stern posts, and as the eliptic figure is continued, and the perpendiculars remain the same, the axis at length shifts and becomes vertical, continuing to diminish its horizontal diameter till it joins the stem and stern in the form of a wedge. The horizontal diameters are so shortened as to form an eliptic water line, when a line is drawn along the bends, or acute curves of the midship sections.

The wheels work vertically through the vessel's bottom, on each side of the keel, and a little abaft the midship cross section. The buckets or paddles are so curved that the cord of their arc shall equal their dip. Their working faces are not radial in any part of their planes, but recede from the perpendicular of the wheels' axis, about the measurement of the paddles' dip. The action of this wheel may be deemed a mechanical paradox, for the paddles enter the water edgewise, push in nearly parallel lines with the keel, and emerge without any lift, and yet have no joints of any kind in their construction. A wheel of this kind in the "Eureka," 9 feet in diameter, makes 39 revolutions per minute, without causing a swell, and the ship never exceeds 7 per cent,; in fact the angle at which the paddle meets the water, together with the wheels' position in the boat, precludes, in a general sense, any slip at all, for the volume of water to be moved before a swell can be made, is at all times many tons weight heavier than the boat or boats she is calculated to tow.

In conclusion I would remark, that as far as 6 or 7 miles per hour is concerned, running singly, or towing boats in line, the experiment of steam traction on canals was successfully tested a year ago, and is now progressing—a large steamer having been completed within the present month, and at the moment of writing this is on her way to the Erie Canal.

HENRY M. PAINE.

Worcester, Nov. 14, 1849.

Struggles of Genius.

It is an interesting spectacle to observe the struggle of man's inventive genius, in conflict with powerful opposing elements, and see the difficulties which are insurmountable to ordinary capacities, overcome by prudence, resolution, and a determined will. Less attractive but only the more instructive, perhaps, is the contrary spectacle, where the absence of those qualities renders all efforts of genius vain, throws away all the favors of fortune, and where inability to improve such advantages renders hopeless a success which otherwise seemed sure and inevitable.

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New Inventions.

A New Foreign Gun and a Home Gun.

Foreign papers state that a Mr. Vandenberg a Flemish gentleman has invented a new gun which can make six and eight charges per minute, carrying the distance of 2000 feet, the ball weighs about one ounce and a quarter, and the powder is one twelfth the weight of the ball. An ordinary gun requires three times more powder, the ball does not weigh half an ounce. The new gun is loaded from the breech. The shape of the ball is round. On the 24th ult., at Utica, N. Y. the new rifle of Mr. Milo M. Cass, formerly noticed by us, discharged 24 balls in two minutes and 30 seconds; then loading with 26 catridges in 4 minutes, and discharged twenty-four in 2 minutes and 30 seconds,—thus loading once and firing 48 shots in 9 minutes. The shooting was very accurate, considering the rapidity, and the performance of the gun gave great satisfaction to those present. The barrel of the gun was so little heated after the first 24 discharges, that it was immediately loaded and again fired, the same number of times. Considering that this is a rifle it far beats the foreign gun.

Machinery for Manufacturing Sugar.

Messrs. Benson & Gray, of Water street, Brooklyn, have just completed a very beautiful apparatus for evaporating cane juice in the manufacture of sugar, which is about to be erected in the Island of Cuba; letters patent have been granted for the invention, the object of which is to evaporate in much less time and at a lower temperature than by any other apparatus; whereby the sugar produced is very clear and has little or no color; we propose giving a full description, with illustrations, soon.

Patent Safety Bridle.

We take pleasure in calling the attention of our readers to the advertisement of Cyrus S. Haldman, in another column. This bridle is the invention of Henry Seitz, and so far as we have been able to learn, it has given entire satisfaction to all who have used it. Mr. Haldman, the manufacturer, is a very worthy young mechanic, and we wish him success in this enterprize.

Machine for Cutting Screws on Bed Posts.

Mr. A. A. Hall, of Gibson, Susquehanna Co., N. Y., has made some beautiful improvements on machinery for cutting the interior screw or thread, on bed posts, which will do as much work by a small machine as twelve men can in the same time. It is self-feeding and acting, and while one screw is forming, the other bed post is working out after the screw upon it has been formed. Mr. Hall has taken measures to secure a patent.

Submarine Plow.

An invention of a plow, to be operated by machinery, to plow under water, has been exhibiting in our city. It is intended to plow a furrow, draw along, lay down and cover a telegraph wire on the bottom, out of the reach of anchors. It would do very well, if there were neither stones nor stumps to be taken into consideration.

New Calculating Machine.

M. Colmar, a French gentleman who invented a calculating machine, about twenty years ago, has improved it in such a wonderful manner, that it is said to be one of the most astonishing pieces of mechanism that has ever been invented, but to our view its complexity shows its defectability.

Substitute for Tobacco.

By late foreign papers, it is announced that a chemist at Leipsic has discovered a substitute for tobacco, which has received high commendations, and is considered to be very valuable by the smoking Austro-Germans.

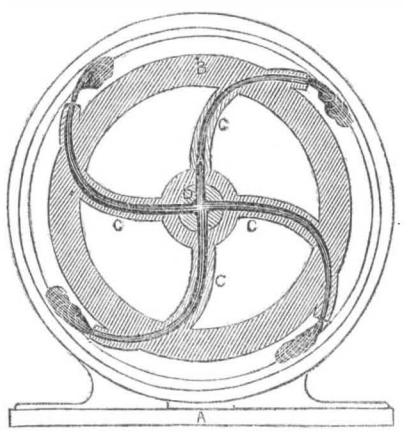
Large Gasometer.

There is a gasometer fitting up in Boston which is 95 feet in diameter, and in it is a pit or cellar 82 feet in diameter, lined on the sides and bottom with brick laid in cement. In the pit, which is partly filled with water, is an immense tub, 80 feet in diameter.

Blowing Machinery.

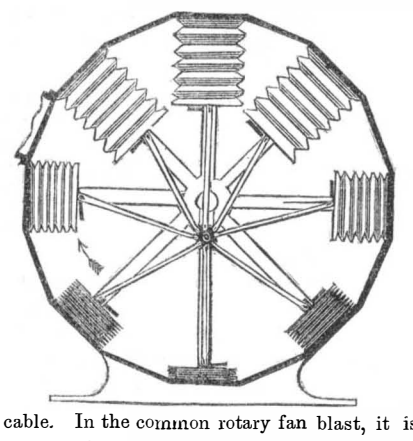
Having had a few enquiries made of us about the Blowing Engine mentioned in the communication in our last number, on "Iron Manufacture," we have received the accompanying as "Novel Blowing Machinery."

Fig. 1.



This is a rotary engine upon the principle of Whitelaw & Stirratt's Water Wheel, to give a direct rotary motion to a fan blast. This cut is an end view and represents a steam wheel with four hollow emission arms, C, and a fly-wheel, B, cast in one piece. The steam enters through its central shaft, D, which is hollow, being conveyed to the shaft by a pipe, bolted up and stuffed at the flange of the steam wheel's shaft neck, which runs on suitable bearings, and allows the steam pipe to project into the neck-steam tight. The object of this steam wheel is to get up the speed on the fan blower, without intermediate gearing, but the loss of power by such an engine is so obvious that no wonder it was mentioned in the article referred to, that it was to be dismissed. Speed and power are two very different things, but great although the speed of a rotary emission engine may be, it moves with too small a velocity to get the power of the steam. A jet of high pressure steam has a great velocity, and the steam should issue from the hollow arm, without any appreciable force to give its impulsive power to the wheel. This would require the jet openings to pass through a space of 160,000 feet per minute—a thing impracti-

Fig. 2.



cable. In the common rotary fan blast, it is asserted that there is always a partial vacuum formed behind the blades, and into it the condensed air in front rushes over the ends, and by the sides of the blades, to fill up the said vacuum. This is alledged to be a great eater-up of power. This invention was got up as a substitute for the rotary fan, and yet it is a rotary. This arrangement consists of a series of cylindrical bellows placed round the interior of a hollow polygonal case, which forms the receiver for the air. Eight stationary arms radiate from a central boss, and are fastened at their outer extremities to the interior of the case. The outer extremities of these arms carry guides for the moving portions of the bellows, which are worked by a set of connecting rods attached at their inner ends to a metal disc fitting on the pin of a crank, upon the driving-shaft passing through the centre of the case. In this way the revolution of the crank is continually acting upon the pairs of bellows so as to preserve an almost perfect uniformity of blasts. Each pair of bellows is fitted with a valve at its outer extremity, opening inwards for the influx of air, and a corresponding valve at the inner end discharges this air into the interior of the case, which thus acts as a large receiver, the air being discharged at an opening in the periphery. The lowest pair of bellows is represented as completely collapsed: the next on the revolving side is still blowing inwards, but has nearly completed its stroke. Each pair is contributing air to the case, as far as the top one, which is fully distended, and about to commence discharging; the remaining ones are receiving air, in readiness for acting as the crank approaches each individnal one.

Foreign Invention.

Abstract of some English Patents enrolled November 10, 1849:

Messrs. W. Brewer, of Clapham, County of Surrey, John Smith of Southville, and S. Lambeth, for improvement in the manufacture of paper. The inventors claim a new mode of producing *water marks* by metal plate dies.

Wm. Kilner of Sheffield, in Yorkshire, for improvements in the manufacture of railway wheels. He employs a hollow fire for wheel tyres and rims. The fire is contained in an iron box. The fire is caused to impinge upon the inner surface of the tyre. It is for wrought iron wheels only.

M. Louis, P. N. D. Piron, for improvement in tubes, for pavements, docks, and breakwaters. For a dock, or breakwater, he used sheet iron cylinders placed in vertically, and in rows traversely, and one row to back up the spaces between the cylinders in the first row. They are built around with concrete, which in due time becomes very hard, while the sheet iron corrodes away and leaves a surface to the action of the water, pierced with many apertures to deaden the force of the waves.

Robert Munn of Rochdale, in Lancaster Co., for improvements in Power Looms. The improvement consists in a mode of removing all the mots and "leaf" from the fabric in the loom. The fabric passes between emery rollers which are so ajusted to act upon the fabric and clean it. This improvement makes unbleached factory cloth look beautiful.

Wm. Henry Burke of Tottenham, for making water proof fabrics. He mixes India rubber or gutta percha, with powdered crude antimony mixed with the carbonate of potash, 25 parts of antimony, to 20 parts of the potash. They are dissolved in 300 parts of water and boiled about one hour, when it is run off into a vessel, and weak muriatic acid is added, till an orange red precipitate is deposited, which is the sulphuret of antimony, and is combined with the india rubber to form the waterproof fabric. This is allowed to be far better than Goodyear's process, which is the combination of free sulphur with the india rubber, which always has a very offensive smell, and effloresces. This subject is worthy of attention on this side of the water.

John Busham of Chelmsford, in the County of Essex, for seperating the fibre from the husks of cocoa nuts. This is to make a fibrous material for cloth of a very beautiful texture, but by no means we believe so strong as cotton.

Alexander Mankittrick of Manchester, for a new lubricating compound. It is made of 4 pounds of india rubber dissolved in turpentine, 10 lbs. of the carbonate of soda, 1 lb. of glue, 10 gallons of oil and ten of water, the substances are to be heated and mixed, first with the water, and the india rubber mixture added last, and well stirred with the others. The whole is then put up in tight jars. This is stated to make a fine lucubrating substance for all kinds of machinery.

Wm. Kenworthy of Blackburne, for improvements in the stop motion of Power Looms.

Charles Isles of Birmington, for improvements in Inkstands, and picture frames. This invention is to cover gutta percha with silk, floss, or wool, in a finely divided state, and to mould it in dies for ink bottles or picture frames. The articles, no doubt, will have a very beautiful appearance.

By late foreign scientific exchanges, we perceive, that gun cotton and the galvanic battery. are generally used throughout Scotland, for blasting and quarrying,

N. O. papers intimate that their city will claim indemnity from the State, for the $113,796 expended in closing the Crevasse.

The Author of the Railway System.

The following is a sketch of Thos. Gray, the author of the Railway system.

Thomas Gray was born in Leeds, England, about a half a century, or more ago—and this is all we know of his early history. The Middletown Collier had a railway to carry coal to Leeds, a distance of three miles. The cars moved along at the rate of three and a half miles per hour. It was laughed at—not by Gray—but by the wise public. Gray saw in his little work something that might be augmented into greatness; and he thought upon the subject, and forthwith became a visionary! He talked and wrote upon his project of "A General Iron Railway," the people declared him insane. He petitioned Parliament; sought interviews with the lords and other great men; and thus became the laughing stock of all England. He received nothing but rebuffs wherever he went. All this took place in 1820, or thereabouts.

But he succeeded at last. The railways were laid. The world has benefited by the madness of Thomas Gray.

Well, what became of him, the reader will ask. We do not know; but we believe he still lives, in Exeter, to which place he removed. Up to 1846 he had been neglected.—While thousands have been enriched by the consumation of his brilliant scheme, he remained forgotten—forced by poverty to sell glass on commission for a living. Howitt, in the People's Journal, a few years ago, gave a somewhat lengthy sketch of his career; thus bringing him into public notiee. We have seen nothing in print in relation to him lately. Elliot wrote a great truth in these words;

"How many men who lived to bless mankind,
Have died unthanked."

How many of the railroad projetcors, agitators, stockholders, &c., have ever heard of the subject of this brief sketch.

Great Quilt.

There was exhibited at the late Mechanics' Fair held at Chicago, Ill., by Mr. C. Taylor, of that place, a quilt composed of 9,800 pieces of silk, each of which was about an inch square, and all sewed with exceeding beauty and neatness. Its chief charm, however, was the great skill evinced in the ingenious blending of colors, so as to produce a proper effect in the representation of various figures which ornamented it in every part. A brilliant sun shone in the centre, the moon and stars beamed out from one corner, while in another appeared a storm in the heavens, with lowering clouds and flashes of lightning.

Around the border were various designs illustrative of the season and of the rapid growth of our western country. At one place appeared a barren heath, with the Indians and hunters roaming over it; next, a trading post, as the first entrance of civilization; next, a military station, with the glorious banner of our country streaming from the flag-staff; then a city, and steamboats and vessels gliding in and out of port.

Lap-welded Iron Tubes.

We would direct attention to the advertisement of Mr. Prosser, on another page; we understand that his tubes are employed in Mr. Collins' new line of steam-ships, that are now getting their machinery in at the Novelty Works. Boiler makers who desire to use the best of tubes, should use the lap-welded kind in preference to others that are of an inferior character.

The Supreme Court of Vermont has recently decided that a firm doing business in the city of New York, and who in the State of Vermont made a contract with an inn-keeper to forward him, by common carrier, spirits which he knew he intended to sell in violation of the License Laws of Vermont, cannot recover the price of such spirits in the Courts of Vermont.

Wesson Rifle Factory, at Hartford, has been sold. The patent on the Muzzle Rifle was bought by Ezra Clark, Jr., the son, we suppose of the inventor, the late Mr. Wesson having purchased the patent from Clark, the inventor.

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Scientific American

NEW YORK, DECEMBER 8, 1849.

Lectures on the Patent Laws.

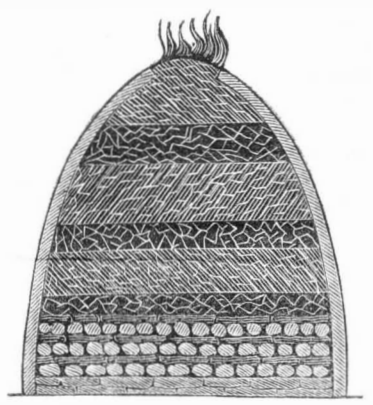
The lecture of George Gifford, Esq., Attorney at Law, upon the Patent Laws, now published in pamphlet form, covers an extensive area. After noticing the Patent Laws of foreign nations, the practice of some of them in granting patents for the introduction of improvements and discoveries, is condemned as "an inducement to those with no merit of invention, to steal the rights of others." There is some truth in this, but there are cases, wherein it is both wisdom and policy in a government to grant patents for the introduction of inventions. The late Commissioner of Patents, Hon. Edmund Burke, wisely mentioned a case of this kind in his last Report, to protect a person who had found out the mode of making that article so much desired and so long kept secret, "Russia Sheet Iron." A just compliment is paid by Mr. Gifford to the merits of inventors and the good they have done to the world. He looks upon the United States of America, as the future "grand laboratory of the would, commanding the entire front of the dominions of Science." We have the same hopes and the same faith, and the Smithsonian Institute is an evidence of what a great man, now dead, thought upon the same subject. Congress is justly denounced for not giving more attention to inventors and patent laws, and the laws of 1836 "bear evidence of hasty legislation," and the way in which the Patent Office is managed, meets with a scathing rebuke, because of the length of time before an application for a patent is examined. The patent laws do not confer a benefit upon an inventor, nor does a patent, but it is a bargain by the inventor to make his invention public, give it to the country, if he is protected in its full enjoyment for fourteen years. Nothing is more true than this, yet a patent is often given to an inventor, as it were a grant of charity. Mr. Gifford proposes an entire reformation of the Patent Office, and lays down his plan. We differ from him on almost every point, and our conclusions are entirely made up from practical data. We may notice this at some other time, and our views will, we have no doubt, meet with acceptance by every person interested. An increase of fees for re-issues is advocated, and an amount equal to the original fee, for additional improvements—$30 instead of $15. The system of re-issues by the law of 1836, from its looseness, is called "oppressive and tending to legalized robbery," and we are startled with something like a revelation of which we were entirely ignorant, and regarding which we consider it to be the duty of the Patent Office to set the public right on the matter, if it is not so, and if it is true, the sooner the Patent Office shuts up one door, all the better for the public. Mr. Gifford states that under the construction of the law of re-issues, "the practice of the Patent Office in granting re-issues has been, not to limit the extent of the claim of the new patent to the invention appearing in the original patent, or to be inferred from the specification annexed thereto, but to enlarge it on ex parte evidence to any additional extent.

Superadd to this practice, the fact that the new patent so issued, is to take effect, as to causes of action subsequently accruing, from the date of the original patent, and is to be deemed evidence of the existence of the invention as far back as the date of such original, and you have a combination of things, the joint operation of which is truly alarming, opening a door for foul fraud and deception, and resulting in the most glaring injustice and the most intolerable outrage upon the rights of men and community, ever passively endured."

By an *ex parte* affidavit, he states, "any vile vagabond may gather up some old patent, useless skeleton, and appropriate to himself all that others have produced for the last fourteen years, and also to extend the bounds of his old patent over all the new territory discovered, after the date of his original patent, and to swallow up what others have invented, put into use, and patented, long before he dreamed of the existence of such things." By this system of re-issues, he asserts that old patents for useless inventions are set as traps to ensnare meritorious inventors and harrass the public, and are resuscitated by "*fraud and corruption*, and sprung upon the community to take from citizens their prosperity and rights." It is recommended that no claim be granted in a re-issue, except such as clearly appears in some form in the original patent, and that no re-issue be allowed after the patent is one year old. The above is strong language, and knocks hard at the door of public opinion. We understand the practice of the Patent Office to be, to grant no claim on a re-issue, except for something exhibited on the model or original specification. If such is not the case—if the above statements of Mr. Gifford are correct, the evil is a foul blot upon our Patent Office practice. But we want facts—cases—to base any arguments we may use to assist in the reform demanded in our Patent Laws. Who will furnish us with such arguments ?

Lime Burning with Mineral Coal.

We have received from a valued correspondent, of Lebanon, Pa., giving the following account of burning limestone in the fields with mineral coal, which must be of interest to our agricultural readers. This mode is pursued by farmers advantageously in some parts of Pennsylvania—the lime-stone being burned in heaps in the field, where it is quarried, or where the lime is to be used ; 30 bushels of coal to 100 of limestone, is used, the two being interstratified for burning.



There are flues dug in the ground, and the above cut is a transverse section, showing the arrangement. These heaps or piles may be made of any desired size : their base is usually 10 to 15 feet wide, and are carried up in somewhat of a gothic arch shape, to a point or ridge, so as to make the height about the same as the base. The quantity of coal used is in the proportion of about one ton of coal to 100 bushels of limestone—if the coal is fine and slaty, a somewhat larger proportion is used. The length of the piles are made to correspond with the quantity of lime desired at one time, say from 20 to 100 feet in length. The ground flues which are about 12 or 18 inches square, are extended about 3 feet out on each side to admit the wood which is burned in them to start the fire and ignite the coal in the heap, which usually takes 4 to 6 hours, and about a half a cord dry wood to a 1000 bushels of coal. After the pile is constructed it is plastered over to within about 18 inches of the top on each side, with wet plaster mortar made of clay ; this covering is from 3 to 5 inches thick. About 1½ feet of the top heap is constructed of small stones or stone chips, and is left uncovered until the fire is fully started, then covered over with dry dirt to keep down a two rapid combustion. The clay coat is put on before firing and is kept plastered over close during the burning. The outside courses of stone are set on edge in an oblique manner, the direction of their inclination being changed each course, which form a zig-zag appearance. The outside courses are laid with care, taking stone of about the same size, but the interior, after the first 2 or 3 courses, is filled up with stone of all sizes, to the extent of 80 pounds, but each coat of coarse stone is filled up and levelled over with small stone of more uniform size —say as large as the first, and then the course of coal is strewn over the smaller stones before another course is added. The first three courses are of about a uniform size of half a brick and covered with a larger proportion of coal than the courses higher up, the depth or thickness of which is progressively increased to 15 or 18 inches in the body of the piles. As the courses are made thicker, so are stone used of larger size—but the coarse stone are to be leveled up and covered with smaller stone to receive the strata of coal.

The ground flues are covered with stone, which are large enough to reach across and lap 4 to 6 inches on each side of the ditch, or the stone may be projected from either side to meet in the middle of the flue—having sufficient bearing on each side of the flue or ditch to keep them from tilting into the flue when laid. Over these stone, and throughout the whole base of the pile is laid a covering, say 3 or 4 inches thick of dry wood, and on this is about 2 inches in depth of mineral coal spread over, then a course of limestone, say size of half a common brick. Coal and limestone are thus alternated for 2 or 3 courses, then the thickness of each course is gradually increased as we raise in height.

Paine's Hydro Electric Light.

MESSRS. EDITORS :—I perceive by the last number of the "Scientific American," that Mr. Paine has been very much pained by my letter in No. 8, so much, indeed, that he finds himself constrained to resort to a very ingenuous method of fighting my arguments, viz., by taking refuge behind a saying which he attributes to Franklin, but in regard to its application he pleads ignorance, merely supposing that the remark of the "Lightning Bottler" must have been called forth by such an attack as I made upon Mr. Paine. I made no personal attack upon Mr. Paine : I used the most respectful language, and if he compares my letter with his own, he will (as every person must) admit that my letter was general—his personal. If I would abuse an inventor "for his invention," I would abuse myself, as I happen to belong to that fortunate, and yet unfortunate class. Mr. Paine avoids meeting my deductions from well established facts in science. His rigmarole about the four elements, and about the South Sea philosopher with his calabash, would have suited a school boy better than a man, to adduce as argument against my objections. I stated in my former letter, and I will state it again, that hydrogen gas during combustion does not produce a white but a bluish light, and it requires carbon mixed with it to produce a good white light. Now Mr. Paine has given publicity to the doctrine that he decomposes water by magnetism, and by burning the hydrogen of the water he produces a cheaper and better light than any that ever has been produced before. The South Sea philosophers who doubt this are Davy, Lavoisier, Liebig, Farrady, Rose, Ure, and men whose names stand far above Mr. Paine's contumely.

Since Mr. Paine sees fit to keep his alleged discovery mum, will he be so good as to state candidly the chemical principle by which the *white* light is produced by the burning of hydrogen. No man will get honor for merely saying I can do and have done such and such a thing. Had Franklin brought his key to Philadelphia and exhibited it charged with electricity, saying that he "had drawn lightning from the clouds," without stating the manner of doing it, he never would have put to silence any doubter, nor would he ever have received the glorious title which Mr. Paine justly gives him.

I have no wish to enter into any controversy, nor impugn any man's motives, I only want more light ; and as Mr. Paine has so often come before the public, heralding with the trumpet of the press his grand discovery, and I, poor mortal, not getting any more light from him at all, I thought that as an humble member of the public—an American public, which never likes to go things blind, that my letter would have been the means of at least getting some satisfaction, not private, but public, but I have been disappointed.

It often happens, and I have proved it by myself, that inventors honestly deceive themselves. In answer to Mr. Paine's objection about the Protection of the Patent Law, I can give the names of many who have become rich by their patents—through law and opposition, and I can give the name of one, at least, who would have been rich, had he patented his invention, instead of keeping it secret, for it was patented by another, who became rich by it, and the first inventor was prevented from using his own discovery.

There have been so many electric lights brought from time to time before the public, that Mr. Paine should have some feeling with the public, who have been so often deceived.

Mr. Paine adduces one reason, and one unkind objection, for not answering my remarks candidly. The reason is, that if *I* do not know that water "is a simple substance, and oxygen water held in solution by positive electricity, and hydrogen by negative," and the objection is, that if I do, "my remarks are insulting and abusive." With great respect I will state that I am ignorant of water being a *simple substance*, and as for the rest which follows, it is puzzling to me. My remarks, therefore, were not abusive, far be it for me to abuse a gentleman of such *profound* chemical knowledge.

I would state, however, that I am perfectly capable of proving that water is not a simple substance, and that the two gases are united and held together by a very different law from that which Mr. Paine lays down. If he chooses to discuss this point I will undertake to prove by *unquestionable* facts, and produce the authority of the most able living chemists, and the most able living Electrical Chemist, that hydrogen alone does not produce a good white light, that it requires a mixture of carbon in some shape ; and that water is not a *simple* substance. I have indisputable established facts "to base my review upon,"—I want Mr. Paine's new facts to controvert what every good chemist knows to be true.

Mr. Paine finds fault with my name, "Gior," and insinuates that I have an interest in some stock or gas company. I will state that I have manufactured gas for public combustion, more than ten years ago, but I have not a cent's worth of interest in any stock or company whatever. Nothing would give me greater pleasure than to see our city supplied with gas so cheap, that all our present companies would become extinct—not that I rejoice at the downfall of any company of men, not that I love them less, but that I love my whole countrymen more, and I would to God that every working man could now use gas as a cheap substitute for oil, camphine and candles. If Mr. Paine does this for our working people, he will ever receive my heart-felt thanks and profound respect. It would gladden my heart to see Mr. Paine come to this city and offer (as by his own profession he no doubt can) to supply the public at one half the cost of our gas at present, I can confidently state that his offer, if properly endorsed, would at the present moment meet with prompt attention.

I am perfectly willing to be dubbed with the title of Carburetted Hydrogen. It is such a beautiful and useful gas, that it is no shame to wear it for a moment, but I preferred Gior, as the most appropriate, and had he been as classical as he is captious, he would not have run against his own lance. Until a better and cheaper gas is produced, I therefore will, out of respect to Mr. Paine, subscribe myself,

Yours truly,

"CARBURETTED HYDROGEN."

New York, Dec. 2nd, 1849.

[We will allow the scientific points only, at issue, to be discussed in future papers, if brief, between Mr. Paine and the author of the above.

Cracking of the Glass of a Clock-face.

We have received the glass of a clock-face from S. Whitcomb, of Natchez, Miss., with a request, if we can, to explain the reason why it was all chipped upon one of its surfaces.—The surface is covered with blisters, which were found on it one morning after a very cold night. We can only account for it upon one condition, viz., that moisture was collected on the glass, which being congealed by the cold, chipped it.

☞ See a letter from our Washington Correspondent, on the second page.

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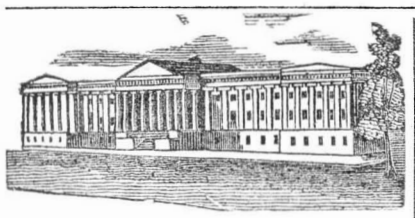

LIST OF PATENTS CLAIMS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending November 27, 1849.

To Edward N. Smith, of West Brookfield, Mass., (Assignor to James H. Gray, of Springfield, Mass.,) for improvement in Machines for folding paper.

What I claim is folding sheets of paper or other flexible substance, by machinery made and operated substantially upon the principle herein set forth; that is to say, by striking the paper or other substance, upwards in the line in which the fold is to be made, from a surface on which it has been extended, and seizing it between converging surfaces which complete the fold and deliver the folded paper; irrespective of the number or forms of folding edges required to give the requisite number of folds to the paper; irrespective, also, of the arrangements and devices for operating the several members of the machines.

To George W. Brown, of Jackson, Mich., for improvements in Flour Bolts.

What I claim is the arrangement of the bolting cloths upon a reel of any convenient construction in such manner as to run the meal over the coarse cloth first, and the use of zinc or other metallic substance in and about the bolts to operate as a cooler upon the flour after it is separated from the bran and shorts.

To Elias H. Merryman, of Springfield, Illinois, for improvements in Butter-working Machines.

What I claim is the use of two or more rollers, with adjustable scrapers, held in contact with the rollers by springs, or other devices, operating in a vat of running water, to wash butter and separate the broken capsules, cheesy matter, buttermilk, and other impurities, by dissolving those that are soluble in water, and washing away those that are not soluble, substantially as described—the water being let into the vat from a cistern placed above the level of the vat, and escaping at the spout, on a level with the journals of the rollers.

To Arad Woodworth, 3d, of Worcester, Mass., and Samuel Mower, of Philadelphia, Pa., for improvement in Brick Presses.

What we claim is to construct and use the sliding charger in connection with the ram piston, as above specified, as to render it, (the said charger) a part of the mould during and for some time after the first percussion of the ram, the same being for the purpose of attaining certain advantages we have above maintained.

We further claim the weighted or spring scraper in its combination with the carriage and the mould plate, and for the purpose of cleaning the top surface of the mould plate, as described.

We also claim to so construct the mould, with the flaring or inclined sides and combine them with mechanism for lifting the brick, a short distance just previous to the second percussion, as specified, as to not only enable the brick to be freed in a measure from its adhesiveness to the mould, but to permit the compressed air or part of the same, in the immediate vicinity of the surface of the edges of the brick to escape, as explained; the diminution of adhesiveness tending to lessen the friction of the clay against the sides of the mould, under the second percussion of the ram.

To John Scoffern, of Upper Holloway, England, for improvement in processes for the manufacture of Sugar.

What I claim is the combined use of sulphurous acid with lead in the manufacture and refining of sugar, substantially as herein set forth.

To John F. Rogers, of Troy, N.Y., for improvement in Railroad Trucks.

What I claim is the arrangement and combination of the journal boxes with the spring casing or pockets, through which bolts are affixed to the frame and acting as guides to the boxes, the whole being constructed in the manner and for the purpose substantially the same as herein specified.

To Charles Learned and Stephen Hughes, of Indianapolis, Ind., for improvements in machinery for dressing Flour.

What we claim as our invention is, first, the employment of a revolving, hanging disc of concentric rows of metallic polygonal beaters, or cutters, and central hollow suspended shaft, made with curved induction and eduction branch tubes, said hollow shaft serving a double purpose of a hanging shaft and air conductor for conveying streams of air to the space between the cylinders, in combination with a revolving disc turning in a contrary direction, also armed with concentric rows of metallic polygonal beaters and cutters, and radial wings arranged and operating in the manner and for the purpose herein fully set forth.

Second, We also claim the employment of the helical plate in combination with the cylindrical bolt for producing the gradually enlarged space into which the flour is received and from which it is discharged in the manner herein described.

We make no claim to the arrangement of the bolting cloth and the othes parts that are in other bran dusters in use.

To Eliakim B. Forbush, of Buffalo, N. Y., for improved form of Teeth in Harvesting Machines.

What I claim is an open triangular tooth, or triangular hollow tooth, for cutting grass and grain, with its results as herein described.

To Cyrus Knapp, of New York, N. Y., for improvement in instruments for Milking Cows.

What I claim is the sack made of any suitable material (gutta percha is preferable, however) in combination with the elastic strap for compressing the teat, and neck of sack, and the exhauster tube and piston, in form and manner, and for the purpose herein substantially set forth.

To Chas. Hopkins, of New York, N. Y., for improvement in Blank Account Books.

What I claim is connecting the leaves of a book with the cover by means of hinged strips attached to the back of the book and to the cover, so that they can be connected or disconnected by means of wires passing through the eyes or knuckles of the hinge strips, substantially as described.

And I also claim making a book in sections, when the sections are provided with hinged strips substantially as herein described, so that they can be connected with, or disconnected from each other, and cover, substantially as herein, described.

To Peter Sweeney, of Buffalo, N. Y., for improvement in Rotary Pumps.

What I claim is the construction of each arm of the piston in such manner that while it is ordinarily kept in its proper position by the pressure of the water, its lower edge will yield to and pass over an obstruction that would otherwise break the pump.

To Christopher W. Fenton, of Bennington, Vt., for improvement in Glazing Pottery Ware.

What I claim is the coloring of the glaze of pottery ware by means substantially as herein set forth and described.

To William Croasdale, of Hartsville, Pa., for improvement in combined Plow and Seed Planter.

What I claim is the construction of the seed planter, as described, consisting of a seeding apparatus combined with a single furrow plow, as described, so as to sow the grain at the first or second plowing in the manner and for the purpose herein fully set forth.

To James H. Aldrich, of Portsmouth, N. H., for improvement in Boring Machines.

What I claim is the combination of three principles, namely, first, the manner in which the bed piece, (to which the carriage is connected) is raised or lowered as before described. 2d, The manner in which the bed piece may revolve to set the auger at any angle or degree. 3d, The manner in which the auger is withdrawn by the direct motion of the crank.

To Abraham and Henry Johnson, of New York, N. Y., for improvement in Stop Cocks and Filters in combination.

What we claim is an improvement on the filtering cock secured to us as aforesaid, is the arrangement of the water passages in the central pipe in combination with the filters having two chambers with a water passage leading from each chamber, and a recess, substantially as herein described, whereby filtered or unfiltered water can be drawn, and the filtering action reversed, as described.

To Milton D. Whipple, of Lowell, Mass., (Assignor to Bay State Mills, Mass.,) for improvements in Machinery for twisting Shawl Fringe.

What I claim is, first, dividing the yarns into proper quantities for the formation of the two strands, by means of the dividing plates and separator, shaped, and made to slide up and down, substantially as herein above set forth.

Second, I claim twisting the two strands separately, first, and then together, by means of the twisting fingers or rollers, constructed and arranged so as to turn inwards and outwards over each other, one above, and the other below the yarns, substantially as herein above set forth.

Third, I claim the peculiar construction and arrangement of the separator, as I have termed it, so that it may open over the rubbers and drop down just before the two strands are to be twisted together, substantially as herein above described.

Fourth, I claim a machine for twisting the fringers of shawls, &c., having a stretching frame, dividing plates and separator, twisting fingers or rubbers, combined and operated successively as herein before specified and described.

To Timothy Shepard, of Oswegatchie, N. Y., for improvement in machinery for dressing Barrel-heads.

What I claim is the application of the shield with the orifice and rest attached to the same in combination with the plane, to prepare the large bevel.

To Charles W. Copeland, of Brooklyn, N. Y., for improved method of regulating the Blow-off valve of Steam Boilers.

What I claim is regulating the "blow-off" water by the action of the "feed" water, so that said "blow-off" water will always bear a certain proportion to the quantity fed, which ratio must vary according to circumstances, and so as to cease entirely when the "feed" ceases to enter the boiler. Secondly, I claim the combination of the "blow-off" valve with the check valve, in such manner that the "blow off" valve will be operated by the stem of the check valve, the whole being arranged and constructed subtantially in the manner and for the purpose set forth herein.

To John Patch, of Boston, for improvement in propellers.

What I claim is the propeller constructed of two spiral curvilinear, tapering plates, formed and secured to the shaft, as represented and described, and connected together at their outer extremities—and this I claim, irrespective of the number of sets of these propellers, that may be placed on one shaft, or of the number of shafts that may be used in propelling one vessel.

To Daniel Jones, Jr., of St. John, N. B., for method of ringing Fog-bells, and an adjustable clapper for the same.

What I claim is indicating to vessels the position of channels, shoals, or reefs, the depth of water or state of the tide or currents, at the entrance of harbors or elsewhere, by the varying ringing or tolling of a bell operated by adjustable machinery, substantially as herein set forth.

I also claim the combination of a shifting weight with the clapper whereby its blows upon the bell in the several positions in which it strikes the same are equalized.

Interesting Patent Cases.

MORSE'S AIR DISTRIBUTOR.

U. S. Circuit Court, N. Y.: Judge Nelson presiding.—In the case of Spalding vs. Eastman, the jury returned a verdict of 6 cents damages for plaintiff. The decision in the foregoing case, affirms the validity of L. A. Spalding's title to Morse's Patent Air Distributor. The defendant in the suit had claimed the use and vending this apparatus—basing his claim upon an early invention and application of its principles. The decision above noted denies such right to the defendant and vests the right to make and vend the "Air Distributor," to Morse and his assigns.

The Planing Machine case of Wilson vs. Barnum is now to be left to the decision of the Supreme Court, U. S., upon written argument, as we noticed last week. Such a case should not, according to our views of the Patent Laws, be left to the decision of the Supreme Court.—We hope it will not hear it. A jury alone should decide the question of fact—infringement.

Planing Machine Patent Cases.

JACOB P. WILSON *vs.* DANIAL BARNUM.—In Circuit Court U.S., Eastern District of Pennsylvania. Issued directed from Chancery.

(Continued from page 86.)

Again: 16 Peters, 346, per C. Justice Taney, et totom curia, "When the patent is for a combination, and the improvement consists in arranging and combining the different parts together in the manner stated in the specification, for the purpose of producing a certain effect, if none of the parts are new, or claimed as new, and no portion of the combination less than the whole, is claimed as new, or stated to produce any given result; and the end in view is proposed to be accomplished by the union of all—arranged and combined together in the manner described, then this combination in the manner described in the specification, is the improvement—is the thing patented—and the use of any two, of these parts only, or of two combined with a third, which is substantially different in form or in the manner of its arrangement and connections with the others, is therefore not the thing patented, and is no infringement. It is not the same combination if it substantially differs from it in any of its parts."

2d. Having thus stated the general principles of doctrines of law applicable to this case, our next inquiry will be wherein consists the invention or combination of machinery employed by the plaintiff to effect the object proposed, in order that you may judge whether the machine or machines used by the defendant, and now before you, are the same in the mode of operation, and therefore the same in principle, and an infringement of the plaintiff's patent.

For this purpose it is unnecessary to give a particular description of the machine, as set forth in the plaintiff's specification, as the machine is before your eyes.

What is the peculiar combination of mechanism, its peculiar structure, and constituent parts which are said to constitute the principle of the machine, are best described by the patentee himself, and to this we must look without reference to any particuliar notions advanced by witnesses on that subject. The Patentee is required to give a specification of what he claims as his own invention, or what is called the principle of it, that others may be informed of his claim, and not left ignorantly to invade or encroach upon his rights.

1st. It purports to be the invention of "a new and useful improvement in machines for planing and grooving and dressing boards, &c."

2d. It is a combination of instruments, already known, by which a result is produced with greater facility, and less labor and expense than any heretofore attained by any combination of the same tools in machinery. It is the employment of rotating planes, called in the specification a plaining cylinder, which will be made to revolve, either horizontally or vertically, in combination with rollers (or other analogous device) to prevent the boards from being drawn up by the planes when cutting upwards, or from the reduced or planed to the unplained surface. Also, the combination of rotating planes, with cutter wheels, for tongueing and grooving, for the purpose of tongueing and grooving boards at one operation. Also, the combination of tongueing and grooving cutter wheels for tongueing and grooving boards at one operation; and finally, the combination of either the tongueing or grooving cutter wheel with the pressure roller.

The patentee, as you may observe, claims four different combinations of his machine, in the whole and in parts, and has not left it open to another to evade his patent by the mere severance of his whole combination into two distinct machines.

Another Great Patent Case.—Planing Machines.

Wilson vs. Brown, at the United States Circuit Court, Baltimore, Judge Heath on the Bench:—The verdict of the Jury was for the defendant—against the Woodworth Patent.—Verdict was given last Saturday, the 1st instant.

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TO CORRESPONDENTS.

"C. S. J., of N. Y."—Such an engine as you want with boiler and all, complete, will cost $500, put upon ship board in this city—we do not deliver them beyond this city. The engine will be of the most approved kind, with cylinder boiler.

"J. S. D. of Geo."—We forward a copy of Cook's Condensing Engine Plate, on the 30th. to Messrs. Lightfoot & Flanders Macon, Geo.

"S. C. A., of Miss."—The plan suggested by you for fastening hoops, has been secured by patent: Mr. S. Pratt, Chelsea, Mass, is the patentee. $2 received.

"W. S., of Conn."—We have examined your model and think favorable of the new additions. Please send us the Patent fee, $30, and we will proceed with the business without delay.

"J. T., of Ala."—The common way of annealing is to place the castings in an oven, called the "annealing oven," and heat it up until the castings are about a faint red heat, then withdraw the fire and let the castings remain until is all is quite cool. Another way is to put the castings in an iron box—put the box in the fire and give it a faint red heat, then withdraw the fire. Cover them all with warm ashes and sand, and let them remain so until all is quite cool. Your name is entered properly on our books, and the paper is sent from this office every week. Patent laws sent.

"W. A. W., of Ala."—Much has been done in the way of lamps, but we should think from the description that your plan was new. You had better send one of the lamps, together with a full description of its distinguishing features, and $30. The business will undergo a searching examination before an application is made—and our fees for making out the necessary papers, will be as reasonable as we can make them. We shall write you by letter as soon as the model reaches us.

"J. P., of Me.; E. T. B., of Conn, and I. N. H., of Pa."—The lathes referred to are not adapted to ornamental trimming—the knife accommodates itself to the pattern. For instance, if you wish to turn a shovel handle, the pattern must be of the form intended. The description is clear, we think, so that any one can understand the principle upon which it operates. J. P.'s letter has been forwarded to the inventor, as we are not authorized to furnish them as he proposes.

"E. B., of Conn."—We cannot inform you where to obtain the desired information at present. Pratt & Co., of this city, we understand, are about to publish a Directory of the Middle States, which will contain all the information you want, they can furnish the New England Directory, new, at $1, having a list of all the trades.

"E. A. D., of N. Y."—Your apparatus for raising substances has been examined, although there may be an improvement over the patent referred to, still we think it embraces many of the distinguishing features found in the original. Therefore a patent would be of no value to you whatever.

"J. P., of Ky."—The model of your Twere Iron has been received and will be examined in a few days. We paid $2,75 expense on the model and applied $2 for one year's subscription as per request, which leaves 25cts, to your credit.

"A. B. W., of Mass."—The model and engravings of your machine were forwarded by express as you requested.

"G. R. C., of N. Y."—We shall be pleased with any effort you may choose to make in extending the circulation of this Journal. Accept our thanks for yours of the 26th. Specimen numbers sent.

"A. C. G., of Ohio."—The drawings of your non-Condensing Engine has been examined. By reference to Dr. Lardner's work on the Steam Engine, page 325, you will find an engraving and description of Trevethick & Vivian's Engine, the first that was ever brought into practical use in Great Britain. You will find it the same as yours, with a slight variation in the mechanical construction.

"S. H. M., of Pa."—We have been unable to find you a good cheap work upon practical printing. We saw a few days since a second volume devoted to printing, for which the owner, charges $35.

"M. W. Stevens."—We should have replied to your communication of the 29th ult, by letter, had you given us any directions. The P. M. also omitted to stamp the letter properly. We can see no objection to your method of separating ores, but think it very good. There is however so little novelty in the arrangement that a patent would be doubtful under our laws. You had better submit it to test, as many of the Gold washers which would separate brass and lead filings from the dirt failed in their operations at the mines. Glass tubes would be a serious objections to their use in the mines, as they would be liable to get broken.

"J. C. E., of Mass."—Your papers and model have been examined, there can be no doubt in regard to the success of an application for letters patent, the principle is good, and you had better take steps to secure it without delay.

"H. S. P., of S. C."—We shall attend to your communication as soon as possible, have patience and we will tell the all.

"W. D. of N. Y."—Please call upon us in regard to your business, as soon as convenient.

"C. J. C., of N. Y."—A very good receipt for making Copying paper is to prepare a stiff ointment of butter or lard and lampblack. Smear it thinly and evenly over soft writing paper, by means of a piece of flannel, then wipe of the redundant portion with a piece of soft rag, and dry it in a warm place. Place it on paper and write on it with a solid pen.—By repeating the arrangement, two or three copies may be obtained at once.

"J. Y. S. of Pa."—The law does not prevent you from making and selling your machines previous to obtaining letters patent.—We cannot tell you at what time the application will be examined.

The specifications and drawings belonging to individuals with the following initials, have been filed at the Patent Office since our last issue:

J. Y. S., of Pa., G. C., of Me., A. R. T., of Ill., W. S. D., of N. Y., H. C., of Va.

Money received on account of Patent Office business, since Nov. 30, 1849:—

A. L. S., of N. Y., $50; A. H. H., of Pa., $30; J. R., of N. Y., $20; J. Y. S., of Pa., $10; M. H., of N. Y., $10; J. T., of Mo., $63; N. R. C., of Conn., $18; A. N. P., of Mass., $30; J. P., of Ky., $5.

We have several models and communications in the office awaiting examination—we shall attend to them as soon as possible; our friends must bear with a few days' delay, as we are very much driven at present: our intention is to devote one day in the week, exclusively, to examinations.

Models.

We have to request persons sending models to us to be particular in pre-paying the expense of transportation. Lately the tax upon us has been severe, and unless this request is complied with, so far as it is possible to do so, we shall take the liberty of refusing the model.

We have to acknowledge the receipt of several fine specimens of hominy, prepared by the new process of Mr. O. P. Stevens, of Ohio city, Ohio. We may have more to say in regard to it in future. Perhaps we shall give our editorial brethren an invitation to a supper of hominy and milk, soon.

Notice.

Whenever any of our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

ADVERTISEMENTS.

Patent Office.

128 FULTON ST.

NOTICE TO INVENTORS.—Inventors and others requiring protection by United States Letters Patent, are informed that all business relating to the procuration of letters patent, or filing caveats, is transacted at the Scientific American Office, with the utmost economy and despatch. Drawings of all kinds executed on the most reasonable terms Messrs. Munn & Co. can be consulted at all times in regard to Patent business, at their office, and such advice rendered as will enable inventors to adopt the safest means for securing their rights.

MUNN & CO.,
128 Fulton street, New York.

THE RAMBLER FOR 1850.—The BOSTON SATURDAY RAMBLER will commence its Fifth Yearly Volume on Saturday, Jan. 5th, 1850, on which occasion it will appear in an entire new and elegant suit of type, printed on fine paper, and in all respects equal to the handsomest journal of the day. Several other important improvements and new features will be introduced, and it is intended that the paper shall in every respect present higher claims to the patronage of the public than it has yet pretended to. The volume will open with a splendid original romance by C. W. Webber, Esq., author of "Old Hicks the Guide," "The Gold Mines of the Gila," "Shot in the Eye," &c. It is entitled "The Bravo Ranger," or "The Scalp-Hunter of Chihuahua, and will probably extend through eight or ten numbers of the paper. Mr. Webber is known throughout the country from his daring excursions into comparatively unknown portions of the continent, as well as from the fresh and entertaining account of his adventures which he has given to the world in "Old Hicks" and the "Gold Mines of the Gila."

Among other features of our paper, worthy of note, may be mentioned the department for Farmers, in which origiual articles appear weekly from the best agricultural writers in New England; the Financial and Business department, under the direction of an accomplished financial writer; the Markets, which we report with more than usual fullness; the Shipping List, into which we condense with grear care, all marine intelligence of interest, to New England readers; the News Department, to which careful attention is devoted; besides which is given early intelligence of all new inventions, and discoveries, sketches of travel, historical, biographical and scientific articles, Sunday readings, puzzles, enigmas and problems, humorous sketches, and everything else that can benefit or interest the ordinary reader. The Illustrations will be continued weekly, and an entirely new field of embellishments will be entered upon.

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PHRENOLOGY.—Each number will contain either the analysis and location of some phrenological faculty, illustrated by an engraving, or an article on their combinations; also the organization and character of some distinguished personage, accompaied by a likeness, together with frequent articles on Physiognomy.
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[See Engraving of the above Bit in No. 26, Vol. 4, "Sci. Am."] 9

PREMIUM STOVE POLISH, &c.—Quarterman's Chemical Oil Stove Polish, American Atomic Drier, Electro Chemical graining colors, and gold size. The stove polish is put up in tin boxes of 12 1-2 to 31 1-4 cts. Sold wholesale and retail at 114 John st., New York, by
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Scientific Museum.

On the Crank.

"Attend to the voice of Experience."

MESSRS EDITORS:—I have addressed this to you for publication, under protest, that I do not enter the arena of public discussion, but purely for the purpose of giving information, the publishing of which may primarily benefit many inventive mechanics.

You perhaps remember having an application from me the past summer, respecting a substitute for the crank. In your answer you stated the inherent defect of my substitute to be "the giving uniform leverage at all points of the revolution." This is not the only one: when you have done all, the pitman and crank will do the same, in the same cylinder with the same pressure. The formuke to prove this is simple.

By the agency of a pair of dividers inscribe a circle of any magnitude; the centre is the position of the shaft, and any direct motive power may be supposed to act upon the circumference of the circle to cause it to revolve—the working length of cylinder is one half the circumferential distance in all cases, which may be represented by a line drawn in the position the cylinder would occupy. The question now arises, what length of crank have we relatively? Just one half the working length of the cylinder. Take the stroke of the crank by dividers, and placing one of their points again at the shaft centre, inscribe another circle: the inward circle gives us the direct continued mover, the outward (which mark is once and a half the diameter of the other, nearly) the crank—subdivide the circles by two lines, one drawn to intersect the two dead points, the other the positions of greatest power; divide these subdivisions by dots, touching different angles, and draw from these dots, lines to represent the different positions assumed by the connecting rod in a revolution; also dot the line touching the two points of extreme power into spaces which shall represent the leverage. Now wherever the pitman crosses this line in its various evolutions, its power is at once defined by the spaces of leverage which it encloses: there will be perceived an excess from a certain point to another certain point which exactly corresponds with the deficiency between others; so that the increased leverage is in all instances exactly the amount of the diminishment. The pitman, working as it does, is also compensating: there is evidently no loss from obliquity of action, as a diagram, and, failing that, actual experiment will prove. Searching the works of Renwick, Lardner, Bourne, etc., for information, and not satisfied with the assertion of Messrs. Munn & Co., that my substitute was useless, I proceeded to test the question by steam; the result is the above. I now believe the exchanging the crank for any other medium of transferring reciprocating into rotary motion, one of the mechanical fallacies of the day. It is a trite saying that what we gain by experience, not too dearly purchased, is all the more valuable; and you are aware there are some who, whatever you assert, unless you prove as you go, are unbelieving still. I have been incited to make this communication, believing that many, more indigent investigators than myself, might thereby save time and expense, which would be vital to them; and by giving these facts publicity I conceive that you will be more instrumental than myself in conducing to the well being of a most worthy class of our community. I remain, respectfully, yours,

WM. B. TOBEY.

Syracuse, Nov. 23d, 1849.

Death from the Prick of a Pin.

Two weeks ago in Albany, N. Y., a young man named Henry Dodge run a pin into his arm just below the elbow, which was instantly extracted, and it was anticipated that nothing serious would occur from the slight accident, but on Tuesday his arm began to swell most alarmingly, from the effects of the poison and though medical attendance of the best character was secured immediately, the swelling extended to the belly, and on Wednesday he was no more.

History of Propellers and Steam Navigation.

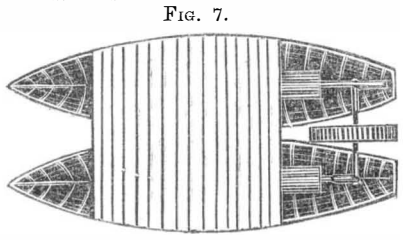
[Continued from page 88.]

EVANS, SYMINGTON, MILLER.

In 1686, Oliver Evans, of Philadelphia, a man of a most ingenious and constructive turn of mind for mechanics, proposed to navigate vessels by steam and paddle wheels. About this time a boat was run for a short time, by steam, between Philadelphia and Bordentown, but we have no means of ascertaining the nature and construction of the propelling parts. About the same time Dr. Franklin proposed to propel vessels by the immediate action of the steam upon water, but this was found to be utterly incompetent for the purpose. A Mr. Latrobe, a keen opponent of Evans, but a man celebrated as an engineer, unfortunately for his own future fame, wrote a work against the steam engine for impelling boats. It no doubt at the time retarded steam navigation in America, for, as a general thing, the man who can give a plausible reason against the introduction of a new invention, is held to be a Solomon, while the inventor is too often looked upon either as a knave or an enthusiast. It was the case with the first inventors of the steamboat.

In 1787, a Mr. Patrick Miller, of Dalswinton, in Scotland, took up the subject, and applied steam to propel a double vessel, with a wheel in the stern.

FIG. 7.



The steam engine for this boat was made and fitted up by a very ingenious mechanic, named Wm. Symington, and which is carefully preserved to the present day. The success of this boat was very gratifying, but it was only on a small scale, the cylinder being only four inches in diameter. In 1789, Mr. Symington again, under the direction of Mr. Miller, fitted up an engine on a double boat, 60 feet long. This boat, on the Forth and Clyde Canal, went at the rate of seven miles per hour, and was very promising as an experiment, but unfortunately the boat was too weak for the machinery, which was taken out, and Mr. Miller tried no more experiments. A work published by his son states that out of his private fortune Mr. Miller spent no less than $150,000, making experiments, for which he never received in return a single cent. He was a patriot in mechanical science. It has always appeared strange to us how Mr. Miller came to embrace the idea of a double boat instead of a single one, but so far as it regards the successful and direct application of the piston by a crank, to drive a *single paddle wheel*, the evidence appears to be in favor of his claims, that is, of having put his invention into actual operation. Twelve years after Miller's last experiment, in 1801 and 1802, Symington induced Lord Dundas, a man of mechanical taste and experience, to build a steamboat, for dragging vessels, on the Forth and Clyde Canal. The engine for this new boat had a cylinder of 22 inches diameter, and four feet stroke. This was quite a large vessel, and it took in tow two sloops of 70 tons burden, and moved them with great ease through the canal, at the rate of 19 and a half miles in 6 hours—3¼ miles per hour. This was a great feat, for the wind blew a strong head breeze all the time. This steamboat was also laid up, because the proprietors of the Canal supposed that the undulation of the water by the wheel would wash away the banks. It was made exactly upon upon the same plan as the former small one by Mr. Miller, (exhibited above.)

It was during the period of the building of this boat of Symington, that he received, as he states, a visit from Robert Fulton. He politely made himself known, and told Symington that as he was going to return to America soon but could not go away without seeing the steamboat operate, and would be happy to receive any information Mr. Symington chose to communicate, stating at the same time, that however advantageous the steamboat might be to Great Britain, it would be of far greater benefit to America, with her broad, calm, and long rivers. This is direct testimony that Fulton had the steamboat in his mind before, or why should he go from England to Scotland to see this one. Every inventor, when he has any project in his head, likes to see and know about what is doing in the same line, but Symington was first in the field a bona fide steamboat builder. At the request of Fulton, Symington fired up and carried his guest four miles along the canal, and returned to the place of starting. Fulton took notes, and was very particular in his examinations. It is very singular that at this time, and for a long time afterwards, it was thought that steamboats were not capable of being employed except in placid waters. It is to be regretted that there was not enterprise enough in all Scotland, at this time, to encourage Symington to make his experiments on the river Clyde. We believe that we are not saying too much when we attribute the first real practical steamboat to this man. Our reasons are these:—He was very ingenious and was employed by Mr. Miller on this account; and he was a practical machinist and engineer—he could make and fit an engine as part of his trade, and he was a good tradesman. It is true that the steamboats with two paddle wheels, as they are now employed, are different from his, but he applied by the crank the direct action of the piston rod to revolve the wheel, and this simple and beautiful arrangement has been universally adopted in every steamboat built since that time, except in some screw propellers.

Platinum.

This metal, which in the state it is usually obtained, alloyed with palladium and rhodium joins the hardness of iron to the resistance of most chemical agents possessed by gold, has lately come into much use.

It is obtained from the ore brought from Spanish America, by the name of platina, the diminutive of plata, silver; and which is a kind of metallic sand. The platina is dissolved by the help of heat, in eight times its weight of a mixture of two parts of muratic acid, at 22 deg. Baume, and one of nitric acid, at 35 deg. Baume. When the acid ceases to act, it is to be decanted, and fresh acid poured on the residum, until all is taken up that the acid will dissolve, which generally requires four parcels of the acid. By this means, the iridum and osmium in platina is left in the residuum.

The acid solution is then evaporated until it crystalizes upon cooling, in order to drive off the excess of acid, and diluted with 10 times its weight of water. A solution of sal ammoniac, made as strong as possible, is poured into a solution of the platina, in a quantity beyond that necessary to throw down, all the sediment, which is an ammonia-muriate of platinum, is thrown upon a filter and well washed.

Platinum may be obtained directly from this ammonia muriate, by putting it into a crucible, and exposing it to the utmost degree of heat the chemist can command, observing to press down the mass with a button-headed iron rod, as the salt assumes the metallic form. When completely reduced, the regulus must be taken out of the crucible, and carefully forged; returning it frequently into the fire.

Another method, is to reduce the ammonia muriate by heat alone, without compression, and to melt the spongy mass of platinum alloyed with palladium and osmium thus obtained, with one-eighth its weight of black arsenic and casting it to thin plates, or small rods. This compound metal is then repeatedly heated and forged, until the arsenic is driven away.

Willis found, that platina might sometimes be melted upon a bed of charcoal in a crucible; and M. Boussingault has lately found that platinum always melts in a blast furnace, if the crucible is lined inside with a mixture of clay and charcoal. He thinks this fusion is owing to the admixture thus produced, of silicon with the platinum.

Platinum may be melted in small quantities not exceeding two ounces, by the blast of the oxy-hydrogen blow-pipe, and even kept in fusion for some time.

Platinum is used for crucibles, evaporating dishes, and even alembics: it resists most of the acids, but is acted upon by caustic potasse, and several neutral salts. It may be welded like iron, and the proper solder for it is gold.

The solution of platina is used as a test to distinguished water containing potasse from that containing soda.

The concentration of oil of vitriol is now generally performed in platina stills, with leaden heads. Mr. Parkes had a still of this kind which held 35 gallons, and cost $600.

LITERARY NOTICES.

PULPIT REPORTER.—A new religious journal has just made its appearance in this city, called the PULPIT REPORTER, which is devoted entirely to the publication of recent sermons by the most distinguished divines in the country, without regard to sect. The first number contains several splendid specimens of pulpit eloquence, among which we notice sermons by Edward N. Kirk, of Boston, Albert Barnes, of Philadelphia, George Bush of New York. A year's volume which costs only two dollars, is to contain over a hundred sermons. Just think what a literary curiosity such a volume will form—one hundred sermons from a hundred minds, such as Kirk, Barnes, Bush, Cox, Tyng, Hawkes, Beecher, Storrs, Williams, Welch, Bushnell, Hughes, Adams, Taylor, Chapin, and other kindred spirits.

NATIONAL BUSINESS DIRECTORY.—This is one of the most useful works extant for business men. It contains a complete list of all the Post towns, Post Offices, and Post Masters, in the United States, carefully revised and corrected from Government records; and the price for which it is sold (being only 25 cents) brings it once within the reach of all. There is scarcely a person in the country, whatever his business may be, who will not realize the amount of money paid for a work of this kind. To the business community it is a work of every day reference, and should meet with a large sale, as an encouragement to Mr. Pratt, the enterprizing publisher. For sale, by H. Long, & Bro., 43 Ann St., Dewitt & Davenport, W. F. Burgess, and booksellers generally.

Any of our friends wishing one of the dictionaries, can enclose the amount to us.

THE WESTERN JOURNAL.—This valuable Journal for Nov., published by Tarver & Fisk, St. Louis, Mo., has been received. It is devoted to what is useful, and contains some of the most acute and profound articles on commerce, manufactures, education, &c., that are to be found in any magazine whatever.

FIRST LESSONS IN ARITHMETIC.—We have received from the publishers, A. S. Barnes & Co., this city, a copy of First Lessons in Arithmetic, designed for beginners, by Charles Davies, L. L. D., author of the elements of Algebra, Bourdon's Algebra, and many other mathematical works. This little volume, is the most simple and clear work for beginners that we have ever perused. It has been introduced into the Public Schools of Baltimore, and should be into all our shools.

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